contained in the frame signal, the frame signal being made from a packet signal that contains the destination data, the packet transfer apparatus comprising:

a switch for making a connection path among the nodes and routing device;

a memory for caching source data for an input frame signal from the second node as outgoing route data; and

a shortcut controller for forming a shortcut to transmit a frame signal input at the first node directly from the first node to the second node without routing by the routing device when outgoing route data contained in an input frame signal from the first node is equal to outgoing route data cached in the memory, and caching into the memory source data contained in the input frame signal from the second node as outgoing route data.

REMARKS

Claims 1 – 14 are pending in the present application. Applicants amend claims 1, 5, 9 and 12. No new matter is introduced.

REJECTIONS UNDER 35 U.S.C. §§ 102, 103

Claims 1, 2, 4 – 6 and 8 – 14 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,185,213 to Katsube et al. Claims 3 and 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Katsube. Applicants amend claims 1, 5, 9 and 12 to further clarify the nature of their invention, and respectfully traverse these rejections.

Katsube teaches a packet transfer control method in which a dedicated VPI cut-through path for a specific destination network and a dedicated VCI cut-through path for a specific end-to-end packet flow are predetermined and stored in a memory unit of a

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communications node by a controller. An ATM cell having a VPI/VCI value equal to a VPI/VCI cut-through path may be quickly transmitted via the cut-through path without further routing analysis. Cut-through paths are selected from pooled VPI/VCI cut-through paths, or are added or changed via predetermined messages between communications nodes.

Applicants independent claims 1, 5, 9 and 12 disclose a packet transfer apparatus for switching and transferring a cell or frame signal between first and second nodes and a routing device. Applicants' claimed system includes a switch, a memory and a shortcut controller. In sharp contrast to the system of Katsube, Applicants' shortcut controller as claimed in claims 1 and 9 dynamically caches <u>outgoing route data from the routing device</u>, and determines whether incoming cell or frame signals to the switch contain outgoing route information equal to a value cached in the memory. If a match is found, the shortcut controller causes the switch to transfer the cell or frame signal from the first node to the second node via a shortcut and <u>without forwarding the cell or frame signal to the routing device</u> (see, e.g., page 8, lines 25 through 35 of Applicants' specification). Alternatively, Applicants' shortcut controller as claimed in claims 5 and 12 caches source data from input cells from destination nodes in place of or in addition to outgoing route data.

Applicants' claimed approach is quite distinct from the system of Katsube. While Katsube provides shortcut paths only for those frames associated with a <u>dedicated VPI/VCI cut-through path</u>, Applicants' claimed system operates to cache route information associated with <u>all</u> cells or frames transmitted by the switch. While Applicants' claimed invention updates the cache based on traffic <u>within</u> the switch, Katsube relies on active messaging with other nodes and routers <u>external</u> to the switch in order to update the list of cut-throughs. Applicants' claimed invention effectively avoids

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the need for such supplementary messaging to other nodes in order to update the short-cut list, thereby improving the currency of the cache.

According to the method of Katsube, a value entered in a specific frame field is used to enable a router to determine whether to transfer a frame at the MAC/ATM level, or perform transfer by IP processing (see, e.g., column 6, line 66 through column 7, line 6 of Katsube). In either case, the frame is forwarded to the router. In sharp contrast, Applicants' claimed method employs a short-cut controller that caches destination address and outgoing route data so that, when a received frame destination address matches a cached address, the frame may be directly switched by the switch without forwarding the frame to a router. This reduces traffic to the router, thereby improving system throughput and performance

Accordingly, Applicants' respectfully submit that independent claims 1, 5, 9 and 12 are not anticipated by Katsube, and therefore stand in condition for allowance. As claims 2- 4, 6 – 8, 10 – 11 and 13 – 14 respectively depend from allowable claims 1, 5, 9 and 12, Applicants respectfully submit that claims 2- 4, 6 – 8, 10 – 11 and 13 – 14 stand in condition for allowance for at least this reason.

CONCLUSION

An earnest effort has been made to be fully responsive to the Examiner's objections. In view of the above amendments and remarks, it is believed that claims 1 – 14, which include independent claims 1, 5, 9 and 12 and the claims that depend therefrom, stand in condition for allowance. Passage of this case to allowance is earnestly solicited. However, if for any reason the Examiner should consider this application not to be in condition for allowance, he is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

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Attached is a marked up version of the changes made to the specification and claims by the current amendment. The attached pages are captioned **"Version With Markings To Show Changes Made"**.

Any fee due with this paper may be charged on Deposit Account 50-1290.

Respectfully submitted,

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IN THE CLAIMS

Please amend claims 1, 5, 9 and 12 as follows:

1. (Amended) A packet transfer apparatus for switching and transferring a cell signal among first and second nodes and a routing device, the nodes having each an interface for the cell signal, the routing device having an interface for the cell signal and determining an outgoing route for the cell signal according to destination data contained in the cell signal, the cell signal being made from a packet signal that contains the destination data, the packet transfer apparatus comprising:

a switch for making a connection path among the nodes and routing device;

a memory for [storing] caching the outgoing route data [for a cell signal] from the routing device; and

a shortcut controller for [monitoring outgoing route data contained in] forming a shortcut to transmit the [a] cell signal [coming from the routing device, storing the outgoing route data in the memory, checking an input cell signal to see if outgoing route data contained in the input cell signal is equal to the outgoing route data stored in the memory, and if they are equal to each other, controlling the switch to form a shortcut between] directly from the first node [through which the input cell signal has been received and] to the second node [from which the input cell signal is going to be sent out,] without routing by the routing device when outgoing route data contained in an input cell signal from the first node is equal to outgoing route data cached in the memory,

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and otherwise caching outgoing route data for the input cell into the memory after [and

transferring] the input cell signal [from the first node] has been routed to the second node

[through the shortcut] by the routing device.

5. (Amended) A packet transfer apparatus for switching and transferring a cell

signal among first and second nodes and a routing device, the nodes having each an

interface for the cell signal, the routing device having an interface for the cell signal and

determining an outgoing route for the cell signal according to destination data contained

in the cell signal, the cell signal being made from a packet signal that contains the

destination data, the packet transfer apparatus comprising:

a switch for making a connection path among the nodes and routing device;

a memory for [temporarily storing outgoing route] caching source data for a an

input cell signal from the second node as outgoing route data; and

a shortcut controller for [monitoring source data contained in] forming a shortcut

to transmit a cell signal input at the first node [coming from one of the nodes, storing the

source data as outgoing route data in the memory, checking an input cell signal to see if

outgoing route data contained in the input cell signal] directly from the first node to the

second node without routing by the routing device when outgoing route data contained

the cell signal input at the first node is equal to [the] outgoing route data [stored] cached

in the memory, and [if they are equal to each other, controlling the switch to form a

shortcut between the nodes, and transferring] for caching into the memory source data

contained in the input cell signal [through the shortcut] from [one of the nodes through

which the input cell signal has been received to the other from which the input cell signal is going to be sent out] the second node as outgoing route data.

9. (Amended) A packet transfer apparatus for switching and transferring a frame signal among first and second nodes and a routing device, the nodes each having an interface for the frame signal, the routing device having an interface for the frame signal and determining an outgoing route for the frame signal according to destination data contained in the frame signal, the frame signal being made from a packet signal that contains the destination data, the packet transfer apparatus comprising:

a switch for making a connection path among the nodes and routing device;

a memory for [storing] caching outgoing route data [for a frame signal] from the routing device; and

a shortcut controller for [monitoring outgoing route data contained in] forming a shortcut to transmit the [a] frame signal [coming from the routing device, storing the outgoing routing data in the memory, checking an input frame signal to see if outgoing route data contained in the input frame signal is equal to the outgoing route data stored in the memory, and if they are equal to each other, controlling the switch to form a shortcut between] directly from the first node [through which the input frame signal has been received and] to the second node [from which the input frame signal is going to be sent out, and transferring the input frame signal from the first node] without routing by the routing device when outgoing route data contained in an input frame signal from the first node is equal to outgoing route data cached into the memory, and otherwise caching

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outgoing route data for the input frame into the memory after the input frame has been routed to the second node by the router.

12. (Amended) A packet transfer apparatus for switching and transferring a frame signal among first and second nodes and a routing device, the nodes each having an interface for the frame signal, the routing device having an interface for the frame signal and determining an outgoing route for the frame signal according to destination data contained in the frame signal, the frame signal being made from a packet signal that contains the destination data, the packet transfer apparatus comprising:

a switch for making a connection path among the nodes and routing device;

a memory for [temporarily storing outgoing route] caching source data for [a] an input frame signal from the second node as outgoing route data; and

a shortcut controller for [monitoring source data contained in] forming a shortcut to transmit a frame signal input at the first node [coming from one of the nodes, storing the source data as outgoing route data in the memory, checking an input frame signal to see if outgoing route data contained in the input frame signal] directly from the first node to the second node without routing by the routing device when outgoing route data contained in an input frame signal from the first node is equal to [the] outgoing route data [stored] cached in the memory, and [if they are equal to each other, controlling the switch to form a shortcut between the nodes, and transferring the input frame signal through the shortcut from one of the nodes through which] caching into the memory source data contained in the input frame signal [has been received to the other from which the input frame signal is going to be sent out] from the second node as outgoing route data.

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